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Poverty Decline, Agricultural Wages and Non-Farm Employment
in Rural India: 1983-2004

by

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Keywords: Poverty, Agricultural wages, Non-farm employment, Rural India.

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* This paper has been prepared for the workshop “Household-Level Linkages Between Farm and Non-farm Rural Income Generation Activities” held at the Food and Agricultural Organization, October 11-12, 2007. We are grateful to participants of the workshop and in particular to Gero Carletto for detailed comments. The views in this paper are those of the authors and should not be taken to reflect those of the World Bank or affiliated institutions. All errors are our own.

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Introduction

Twenty years ago the common image of India was one of a vast, populous, country blessed with a vibrant democracy but afflicted by a highly rigid social structure, low levels of human development, widespread and deep consumption poverty, and doomed to eternal economic underperformance. Recent decades have seen some significant changes to that image. Following economic reforms first introduced during the 1980s and continued in subsequent years, India has raced towards the top of the world league tables in terms of aggregate economic performance. There is little doubt that the newly unleashed Indian economy has settled into a new, more rapid, growth trajectory. While future crises may unfold and growth may falter, a return to the sclerotic old days seems unlikely. Indeed, on the economic front the country now faces problems that are linked to success: moving to the next generation of reforms to sustain growth and expanding the benefits of rapid growth—across sectors, regions, and people.

Economic growth is only a means, not an end. It is critical that rising incomes and new opportunities ushered in by a reinvigorated economy translate into welfare improvements. Historically, India's performance in poverty reduction has been rather disappointing. As a share of the population, poverty during the pre-reform decades declined at a pace that was steady, but slow. In the face of ongoing overall population growth it proved very difficult to significantly reduce the total number of people suffering from staggering levels of material deprivation. A question of central importance has thus been whether the newly galvanized, Indian economy heralds also a decisive break with the past in the domain of poverty reduction. This question has engaged a large community of researchers and analysts during recent decades.

This paper focuses on rural areas and presents evidence from household surveys to ask whether rural living standards have improved significantly over time. It first reviews evidence on rural poverty in India from four large-scale surveys carried out in 1983, 1987/8, 1993/4 and 2004/5. The paper notes that there is little consensus as to the rate of poverty decline during the 1990s, due to well-discussed problems of comparability in the consumption module of the 1999/0 NSS survey. The 2004/5 survey thus provides the first opportunity to check whether, and how rapidly, poverty has declined since the

early 1990s. The evidence indicates that there has been modest progress in rural poverty reduction during this period but that it is associated with considerable variation across regions. The paper shows that the estimates produced here correlate well with data on changes in agricultural wages at the region level.

The paper finds that at the all-India level there has been no decline - indeed during the 1987/8, 1993/4 and 1999/0 survey years, some increase - in the share of the adult population in rural areas with primary occupation in agricultural wage labor. The paper confirms the historically close association between poverty and agricultural wage employment. The strong association is seen not only in terms of the strikingly lower per capita consumption levels amongst agricultural laborers, but also the generally low educational outcomes amongst agricultural laborers and the high percentage of such laborers belonging to the lowest castes.

There is little evidence of broad, across the board, acceleration in agricultural wage growth during the 1990s. In a majority of regions, real agricultural wage growth between 1993/4 and 2004/5 is lower than what was observed during the 1980s. In some regions real wages actually declined.

A sector that is often looked to for impetus in rural poverty reduction is the rural non-farm sector. This sector accounts for nearly half of rural household income in a significant number of states in India. The sector is highly heterogeneous and can be crudely divided into three sub-sectors comprising: regular, salaried non-farm employment; casual wage labor in the non-farm sector; and non-agricultural self-employment activities. The former sub-sector is most clearly associated with relatively high and stable incomes, while the latter two are more heterogeneous and can comprise both productive as well as residual activities. NSS data indicate that during the reference period there are signs of modest growth, on aggregate, in the size of the non-farm sector. While overall employment levels in the non-farm sector remained remarkably stable between 1987 and 1999/0, there is evidence that this has picked up between 1999/0 and 2004/5. The paper finds that throughout this period the poor are hardly represented at all in the regular non-farm sector and are only slightly more involved in non-farm self-employment. Only in the case of casual wage-labor in the non-farm sector do the poor appear to have a somewhat greater involvement in the non-farm sector than do the non-

poor. Multinomial logit models indicate that those with little or no education, or those who belong to the scheduled castes or tribes, are much more likely to have agricultural wage labor as principal occupation than any of the three non-farm occupations. Indeed, the probability of employment in the regular non-farm sector is particularly strongly associated with high education levels and high social status.

Despite evidence of only modest change, in terms of poverty reduction or diversification out of agriculture, at the national level, NSS data reveal a great deal of heterogeneity in these outcomes at the sub-state region-level. This regional variation can be exploited to study econometrically the relationship between poverty, agricultural wage labor employment and non-farm employment in rural India. The analysis reveals that poverty is associated in a complex way with the non-farm sector. Notably, the data indicate that expansion of non-farm employment is not significantly and independently associated with poverty decline. There is little evidence that non-farm employment can be viewed as an important route out of poverty. However, expansion of this sector does appear to put pressure on wage rates in agriculture. Rising agricultural wage rates are, in turn, strongly correlated with rural poverty reduction. Thus, there is some evidence consistent with an important *indirect* impact of the non-farm sector on rural poverty.

The evidence assembled in this study from the NSS surveys thus offers some empirical support to the view that the period between 1983 and 2004/5 was one of gradual economic diversification out of agriculture and limited poverty reduction in rural areas. But it is important, as well, to acknowledge the limitations to the analysis here. The analysis stops in 2004/5 and we are unable to say what has happened since that survey year. The analysis is also somewhat partial in its examination of sources of rural livelihoods. Notably, we do not focus here on the relationship between poverty and agricultural production, nor on the evolution of agricultural output over time. This omission is due to lack of data in the NSS surveys on farm production and household incomes.

In the remaining sections of this paper we turn in greater detail to the empirical underpinnings of the basic story outlined above. In Section II we consider the evolution of poverty in India. Section III looks at agricultural labor and agricultural wages. Section IV documents the size and evolution of the non-farm sector between 1983 and

2004/5, and Section V exploits a region-level panel dataset across three of our four surveys to bring together the arguments of the preceding sections and Section VI offers some concluding comments.

II. Poverty 1983 – 2004/5

Until the recent release of the 2004/5, 61st round, NSS survey, there was great controversy surrounding the pace, and even direction, of poverty reduction during the 1990s. Much has been written about the difficulties surrounding comparisons of poverty rates from the NSS surveys during this period. A recent special issue of Economic and Political Weekly (January 25, 2003) is devoted to the subject of poverty and its evolution in India, and pays particular attention to the potentially important measurement problem in the NSS surveys for the 1990s. The problem is well described in several of the papers included in the special issue (Deaton, 2003a, Datt, Kozel and Ravallion, 2003, Sundaram and Tendulkar, 2003). Deaton and Kozel (2006) provide a further update on the state of the debate. In a precursor to this paper, Kijima and Lanjouw (2003 and 2005) proposed a number of adjustments to the consumption data aimed at restoring comparability across the 50th and 55th rounds. Their analysis suggested that poverty reduction in rural areas occurred at a modest rate during the 1990s, and was considerably less rapid than what had been suggested by official estimates that ignored concerns about comparability. Separately, Himanshu and Sen (2004a, 2004b) reached a similar conclusion. Given the nature of the adjustments, however, all of these estimates had to remain tentative. A final verdict on what had happened to poverty had to await release of the 61st (2004/5) round of the NSS in which the comparability with earlier surveys had been restored.

In Table 1 we present estimates of poverty for the 38th, 43rd, 50th and 61st rounds and suggest that at the all-India level, rural poverty has declined modestly from 37.2 to 28.4 percent between 1993/4 and 2004/5, a rate of under one percentage point per year. This is nearly the same as the decline from 46.9 percent to 37.2 that occurred during the preceding 10 years (between 1983 and 1993/4). There is little evidence of a striking acceleration of poverty reduction in rural India alongside the well-documented

acceleration of economic growth in India during this period.¹ Table 1 reveals that changes in poverty at the national, and even state, level mask considerable heterogeneity in the evolution of poverty across regions. Indeed, while poverty declined in most regions, it is estimated to have risen between 1993 and 2004/5 in roughly one in six of the regions considered in our analysis.

We consider in the next section trends in employment in agricultural labor, and in agricultural wages, to see to what extent these provide corroborating evidence to the poverty estimates above.

III. Agricultural Employment and Agricultural Wages

There is a long-standing recognition that employment in casual agricultural wage labor is strongly correlated with poverty in rural India (Lal, 1976, Singh, 1990, Lanjouw and Stern, 1998, Sharma 2001, Sundaram, 2001, Himanshu, 2004). Both agricultural wage employment shares and agricultural wage rates have consequently been scrutinized as indicators of rural living standards and how these have been evolving over time.

Agricultural Wage Labor Employment

Table 2 reveals the close association between per-capita consumption levels and employment in agricultural wage labor. Respectively in each of the five NSS rounds examined in this paper, it can be seen that the percentage of the working population (aged 15 and higher and reporting some economically gainful activity) with primary employment in agricultural wage labor is highest in the two lowest consumption quintiles. Indeed agricultural wage labor employment shares are highest by a large margin in the lowest quintile. This suggests that not only is agricultural wage employment a good correlate of the incidence of poverty in general, but that it is particularly closely aligned with extreme poverty and may thus also be a good proxy for measures of poverty that are sensitive to distance below the poverty line. In all survey

¹ In a recent contribution, Deaton (2007) suggests that official statistics may be understating the rate of rural inflation during this time period with the implication that the 2004/5 poverty estimates might be understating the true incidence of poverty in that years. His analysis suggests that the rate of poverty decline between 1993/4 and 2004/5 discussed above may thus be overstated by 3 percentage points.

years, the “odds” of being employed in agricultural wage labor fall monotonically as one rises in the consumption distribution, and there is only slight evidence of this association weakening over time.

Table 3 demonstrates that two other important dimensions of well-being, education levels and caste status, are also strongly and inversely correlated with agricultural labor employment. Once again, there is little to suggest that over time, the association between agricultural wage labor employment and low welfare in terms of these other indicators has weakened. Anticipating somewhat the discussion in subsequent sections, we can see in Table 3 that the relationship between non-agricultural employment on the one hand, and educational and social status, on the other, is strong and positive – particularly in the case of regular employment in the non-farm sector.

Employment in agricultural labor shows some signs of expansion over the period spanning the first four survey rounds (Table 4). In 1983 and 1987/8, just under 25% of all males aged 15 and above were employed in agricultural labor. This rose to 25.7% in 1993/4 and grew slightly further to 26% by 1999/0. By 2004/5 this percentage had fallen back to 21.8%. For women, although far fewer are judged to be economically active, the importance of agricultural labor employment is even more pronounced. Here, the percentage of women employed in agricultural labor has fluctuated between 17 and 15% over time. Table 5 indicates that agricultural wage labor employment varies markedly across states. In all four survey years, states with particularly high percentages of the economically active population employed in agricultural labor include Andhra Pradesh, Bihar, Karnataka, Maharashtra, Orissa and Tamil Nadu. The data suggest that in Karnataka, agricultural wage labor employment in 2004/5 was higher than what had been observed in earlier years. However, in Kerala, Orissa, Tamil Nadu, and Uttar Pradesh, employment rates amongst agricultural laborers had declined to historical lows.

To summarize, scrutiny of agricultural wage labor employment shares indicates that there is a strong correlation between employment in this sector of the rural economy and lower living standards, whether expressed in terms of per-capita consumption levels or in terms of broader dimensions of well-being such as education levels and social status. This relationship does not appear to have weakened markedly over time. The importance of agricultural wage employment seems not to have declined markedly during

the 1990s – with several states with higher agricultural employment shares in 2004/5 than, say, in 1987/8 – roughly the time period when economic reforms started being introduced. The evidence that wage labor accounts for a sizeable (and in some places increasing) proportion of total employment in rural India has been noted in the literature (see, for example, Visaria and Basant, 1993, for an earlier analysis). This is sometimes interpreted as a trend towards “proletarianisation” of the labor force. This term is often associated with a situation in which farmers, particularly smallholder cultivators, are “pushed” out of agriculture into wage labor. However, proletarianisation may also simply describe a general shift away from self-employment (mainly in agriculture) towards wage labor. Whether “push” or “pull” effects dominate across rural India varies with the experience of land legislation, population pressure on the land, expansion of non-agricultural opportunities and related factors. Proletarianisation often takes place against a background of rising real agricultural wages and this suggests that there are “pull” factors at work. At the same time, the observation that employment shares in agricultural wage labor rose in during the interval between 1987/8 and 1999/0 rounds while at the same time an increasing percentage of illiterates and of disadvantaged castes were represented amongst agricultural laborers, suggests that agricultural labor has remained a “last-resort” employment option; one where “push” factors are certainly not absent.

Agricultural Wages

The evidence presented above suggests that agricultural wage employment can serve as a valuable window on living standards in rural areas. Agricultural wage rates prevailing in rural areas provide a further perspective on the livelihoods of this segment of the rural population. As has been pointed out by Deaton and Drèze (2002), agricultural wages can be viewed not only as useful proxies of poverty but can also be seen as indicators of poverty in their own right insofar that they capture the reservation wages of the rural labor force.

Agricultural wage data are available in India from a variety of sources. Himanshu (2004) provides a detailed assessment of the different sources available, and documents the differences in the methodologies and survey designs that are applied. He points to

serious problems of transparency as well as of comparability and interpretation across the different wage series. He argues that calculation of agricultural wage rates directly from the NSS surveys is not only feasible, but quite possibly yields more reliable figures than are available from alternative sources.

Table 6 presents state-level estimates of real agricultural wages calculated from our five rounds of NSS data. The estimates for 1993/4 and 1999/0 accord quite closely to those calculated separately by Himanshu (2004).² From Table 6 it can be seen that during the 1980s real agricultural wages showed relatively little growth. Indeed in 8 states, real wages declined. This pattern accords with the widely-held notion that 1987/8 was a poor agricultural year. Beyond 1987/8 and until 1990/0 real wages rose in all states. However, between 1999/0 and 2004, real wage growth slowed, and in some states real wages actually decline. Only in Assam, Orissa and UP is there evidence of real wages rising more rapidly between 1999/0 and 2004/5 than during the preceding two survey rounds.

To what extent do poverty estimates correlate with real agricultural wages? Table 7a presents Pearson and Spearman rank correlation coefficients of region-level poverty estimates and the accompanying regional-level agricultural wage data, in turn for the four survey years deemed to yield comparable poverty estimates. All of the correlation coefficients are very significant and negative – indicating that, indeed, poverty rates, regardless of the year of the survey, are lower in those regions where agricultural wages are higher. Table 7b looks at *changes* in poverty and *changes* in agricultural wages. The correlation is not significant in the first two pairs of years, but between 1993/4 and 2004 there is a clearly negative and significant correlation between poverty growth and agricultural wage growth.

² Himanshu (2004) cautions against calculation of agricultural wage rates from the 1987/8 round of the NSS, arguing that the unit record data do not produce wage rates that are readily comparable to wage estimates for that year published by the NSSO itself. We have chosen to calculate and report the 1987/8 wage rates, but acknowledge that they may be less reliable than estimates for the other two years. In the econometric analysis reported in section V, we do not include the 1987/8 data due to these comparability concerns.

IV. Non-Farm Employment

As described in Section I, the rural non-farm sector is widely looked to as a source of momentum for rural growth and poverty reduction. Employment patterns in the non-farm sector have been widely scrutinized for evidence of economic dynamism in rural areas. Visaria and Basant (1993) carefully examine National Sample Survey and Census data and document a clear increase in the share of non-agricultural employment in the rural workforce during the 1980s, with the trend more clearly evident among males than among female workers. In addition, the evidence appears to point to a more rapid expansion of tertiary sector employment rather than of secondary sector employment, and that the bulk of employment growth is of a casual nature, rather than permanent. Surprisingly, this expansion appears to have slowed during recent years. Unni and Raveendran (2007) suggest that long-term employment growth in rural areas slowed down substantially between 1993/4-2004/5 relative to 1983-1993.

Fisher, Mahajan and Singha, (1997) conclude that between 18-25% of rural employment occurred in the non-farm sector at the beginning of the 1990s. An important observation made in this study was that approximately one-fifth of total rural non-farm employment was estimated to be generated by public sector services, primarily public administration and education (see also Sen, 1996). Other important sectors in terms of employment shares were found to include retail trade, personal services, construction, wood products and furniture, over-land transport, and textiles. While manufacturing activities are often the first that come to mind when discussing the non-farm sector, the study showed that services are easily as important.

A study by Acharya and Mitra (2000) draws on multiple rounds of National Sample Survey data (spanning the period 1984-1997), and also two rounds of the Economic Census (corresponding to 1990 and 1998) to ask whether the positive nonfarm employment trends of the 1980s have continued through the 1990s. They find little evidence of further expansion. At the all-rural India level they find that employment in the secondary and tertiary sectors grew from about 22% of the workforce in 1983 to about 25% by 1987-8. They found no evidence of further growth during the 1990s; the last NSS survey they examined (“thin” round for 1997) indicated an employment rate of

about 24%. The authors note considerable variation across states in the degree of occupational diversification (with states such as Kerala, Punjab, Haryana, Gujarat and Tamil Nadu clearly more diversified than others), but observe no clear evidence of growth in nonfarm employment rates during the 1990s occurring in any state other than Kerala (Acharya and Mitra, 2000).³ Unni and Raveendran (2007) suggest that nonfarm self-employment and non-farm casual wage employment sector grew slightly more rapidly between 1993/4-2004/5 than during the preceding decade. However, they point to evidence of a less rapid growth rate in regular non-farm employment during this period.

An important recent paper by Foster and Rosenzweig (2003a) provides a theoretical exposition of how the non-farm economy interacts with the farm economy - building on the great heterogeneity of non-farm activities in rural areas, and highlighting the importance of general-equilibrium relationships. The authors argue that a key distinction has to be made between traded and non-traded goods and services, and they emphasize the significance of wage and salary employment in non-farm activities as opposed to the self-employment activities that have traditionally been the focus of attention. Foster and Rosenzweig (2003a and 2003b) analyze NCAER data from roughly 250 villages covering the period 1971, 1982 and 1999 to study the evolution of the non-farm economy in rural India. These data permit the authors to calculate non-farm incomes, and they show that non-farm income shares have increased significantly during this time period.⁴ Foster and Rosenzweig suggest that a growing rural based export-oriented manufacturing sector can be expected to have an important pro-poor impact in rural India, possibly more significant than that which can be expected from agriculture-led growth. This follows from their observation that rural diversification tends to be more rapid and extensive in places where agricultural wages are lower and where agricultural productivity growth has been less marked. Although the Foster and Rosenzweig study employs different data definitions and conventions than NSS-based studies (including the present study) their

³ In his exhaustive examination of NSS data between 1977/8 to 1999/0 Vaidyanathan (2001) observes many of the same trends reported here.

⁴ Foster and Rosenzweig (2003b) suggest that non-farm income shares grew from just under a third in 1982 to nearly 50% in 1999. A study by Lanjouw and Shariff (2002) based on a different NCAER dataset for 1993 calculated a rural non-farm income share of 37%. This is suggestive of steady growth of the non-farm sector throughout the 1980s and 1990s – a trend which NSS employment data do not appear to corroborate (see below).

evidence is suggestive of a very significant rise in non-farm employment shares during their study period. They suggest that by 1999 about 44% of males aged 25-44 had primary employment in the non-agricultural sector by 1999. These figures appear higher than what NSS data suggest (although the figures cannot be directly compared as they refer to different age groups and different employment definitions). An important question is whether expansion of the non-farm sector observed by Foster and Rosenzweig occurred steadily during their reference period, or whether it took place in fits and starts. As others have already suggested, and we shall see further below, NSS data indicate that between 1987/8 and 1999/0 there was little expansion of non-farm employment in rural areas.

A recent study by Eswaran, Kotwal, Ramaswami and Wadhwa (2007) pursues the question of whether expansion of the non-farm sector is likely to influence agricultural wage rates. This could be an important route through which rural non-farm employment influences rural poverty, particularly if, as suggested by Foster and Rosenzweig (2003a,b) non-farm enterprises have been establishing themselves in areas where agricultural wages are low (and therefore rural poverty is high). The analysis by Eswaran et al (2007) draws on NSS data in combination with total factor productivity data from other sources. They find that agricultural wage growth during the period 1983-1999 has been driven for the greatest part by changes in agricultural productivity and that the contribution of the non-farm sector to real wage increase is likely to have been no greater than a quarter.

Non-Farm Employment Shares

Turning to our own calculations from NSS data, Table 5 breaks down employment shares between agricultural labor, cultivation, and non-farm activities by year and state. Non-farm employment is divided into three categories: regular employment (generally salaried), casual employment (daily wage) and self-employment/own enterprise activities. This distinction is intended to reflect to some extent the very different characteristics of non-farm activities in rural areas – characteristics that are important in terms of defining the desirability of such jobs. A general typology that appears to resonate with findings from many village studies is that regular non-farm employment is typically highly sought-after in rural areas as it is

associated not only with high incomes, but crucially also with a degree of stability. Non-farm self employment activities can be both residual, last resort options as well as high return, productive, activities, but whether they are of the former or latter variant generally depends on the amount of capital resources that can be brought to the activity. Casual non-farm wage employment is generally thought to be less demeaning to a worker than agricultural wage labor, but returns may be only marginally higher and the nature of the work may be both physically demanding as well as hazardous (construction, rickshaw pulling, industrial workshops, etc.).

Between 1983 and 2004/5 overall employment shares in non-farm activities have ranged between 22-32%, reaching their peak in 2004/5 (Table 5). In each respective survey year, wage and salary employment has tended to account for about 11-16% of overall employment, with the balance made up by self-employment/own-enterprise activities. The evidence suggests that there has been at best a slight expansion of this sector over time. There are large differences across states in terms of the importance of the non-farm sector. In Kerala, non-farm employment shares were as high as 77% in 2004/5, and the importance of regular employment in this state grew significantly over time (from under 25% to nearly 40%). In States such as Madhya Pradesh, Bihar, Chattisgarh and Maharashtra, the sector has still to make its presence felt.

Non-Farm Employment and Consumption Quintiles

The distinction between regular, casual and self-employment in the non-farm sector is well reflected in Tables 8a-8c, documenting the relationship between non-farm employment and consumption quintiles in each of the respective survey years.⁵ In all five survey years, regular non-farm employment occurred disproportionately in the top quintile of the per capita consumption distribution (Table 8a). While overall employment shares in regular non-farm employment hovered around 6% throughout this period, the relative frequency of such employment in the top quintile was two or more times higher, while in the bottom quintile it was below 3%.

⁵ Lanjouw and Shariff (2003) observe very similar patterns across income quintiles in NCAER data for 1993/4.

Overall employment shares in casual non-farm activities are only slightly higher than for regular non-farm employment shares (Table 8b). But the distribution across consumption quintiles is quite different. Casual wage employment in the non-farm sector generally occurs most frequently in the lowest quintiles of the consumption distribution. The odds of employment in casual non-farm wage labor are less than one in the top quintiles and greater than one in the bottom three quintiles. There is little evidence of systematic change in these patterns over time.

Non-farm self-employment activities tend to be more evenly distributed over the consumption distribution, indicating that both poor households as well as rich households are involved in such activities (Table 8c). On balance, however, the odds of self-employment in the non-farm sector are slightly higher in the top three quintiles of the consumption distribution suggesting that such activities are more frequent amongst the relatively better off. There is some suggestion that in the 2004/5 survey year the gradient between self-employment in the non-farm sector and consumption quintiles has weakened somewhat. While in this year the percentage of self-employed in the non-farm sector is still lowest in the bottom quintile, the odds of participation are higher than in the other survey years and analogously, the odds are somewhat lower in the top quintile.

As was seen in the case of agricultural wage labor, the patterns of employment observed across the consumption distribution also tend to be repeated in terms of other dimensions of well-being such as education and caste status (Table 3). Education levels and social status are generally highest amongst those with regular non-farm employment while casual non-farm employment is more common amongst the illiterate and scheduled caste and scheduled tribe households. Over time there is some suggestion that casual non-farm employment has become slightly more strongly correlated with higher education levels. This is consistent with gradually rising education levels in rural India over time, and a tendency for those with some education to crowd out the uneducated in casual non-farm employment (see further below).

Non-Farm Employment Probabilities

Of course, education and social status are not just of interest as intrinsic indicators of welfare, but are also likely to play an instrumental role in determining income or

consumption levels – influencing for example, individuals’ *access* to non-farm opportunities. The relationship between occupational choice and household characteristics is explored more systematically in Appendix Tables 2-6 on the basis of multinomial logit models of occupational choice for each survey year (Appendix Table 1 provides descriptive statistics of the explanatory variables employed in these models). We employ the multinomial logit model to explore the individual and household characteristics that are associated with the probability of nonfarm employment in rural India (see Greene, 1993 for a useful exposition of this model). We consider seven broad occupations in rural areas: agricultural casual wage employment; regular farm employment; cultivation; nonfarm regular employment; nonfarm casual wage (daily wage) employment; nonfarm own-enterprise activities; and other (plus non-working).⁶ Our “explanatory” variables comprise a selection of individual and household characteristics. At the individual level we consider the age, educational status, and caste/religious status of each person.

At the household level, we have information on the size of the household to which each person belongs and the household’s per-capita landholding. The latter might proxy wealth and contacts, and thereby provide some indication of the extent to which individuals are better placed to take advantage of *opportunities* in the nonfarm sector.⁷

The multinomial model requires that a particular occupational category be designated as the numeraire against which all results should be compared. We have chosen agricultural wage labour as the comparison group. This implies that parameter estimates for the categories which are included should be interpreted not as correlates of employment in a given occupational category, but as indicators of the strength of association of a particular explanatory variable with the respective occupational category *relative* to the same explanatory variable with agricultural labour. To ease interpretation we consider direct parameter estimates and then produce some derived Tables that summarise the impact of specific explanatory variables.

⁶ We concentrate in this analysis on reported *principal* occupation of males, and are unable to consider, as a result, the set of issues associated with combining farm with nonfarm activities during the course of, say, an agricultural year (with its associated peak and slack seasons).

⁷ It is often noted that the market for the purchase and sale of land is rather thin in rural India, as opposed to the market for landuse – tenancy (see Jayaraman and Lanjouw, 1999). Landholdings may therefore be reasonably exogenous in the kind of models estimated here.

The multinomial logit models confirm that relative to agricultural wage labor, the probability of employment in any of the three non-farm sub-sectors is consistently lower for those who belong to the scheduled castes and for those with no education. This pattern remains unchanged across the five survey years. These findings are summarized in Tables 9 and 10 presenting the predicted probabilities of employment in the various occupations at mean values of the explanatory variables. For example, the first cell in Table 9 indicates that in 1983 the predicted probability of employment in agricultural labor would be about 34.6% if all individuals were scheduled castes or scheduled tribes (with education levels and other characteristics corresponding to the overall average in the population). This probability would fall to 23.4% if their caste status were switched to non-SC/ST. It is important to recognize that these are stylized probabilities – in reality SC/ST's would have education levels and landholdings well below the national average as well. Table 9 indicates that the effect of caste status on regular non-farm employment probabilities appears to operate indirectly through the differential education and landholdings of SC/ST's instead of directly. Holding these other characteristics constant (at their national average), predicted employment in regular non-farm employment is not markedly lower for SC/STs. With casual and self-employment in the non-farm sector, evidence of caste differences are more readily discernable. In general, there is little evidence of marked changes in the role of social status in determining occupational status over time.

Table 10 documents confirms the clear association of education with employment in non-farm activities. Predicted probabilities of regular non-farm employment in all five survey years increase markedly with education levels (at mean values of other characteristics), while they fall sharply in the case of agricultural labor, and more moderately in the case of casual non-farm employment. There is little evidence of a strong role for education in self-employment activities. Once again, this is possibly the consequence of the heterogeneity in the kind of self-employment activities that take place.

Finally, the multinomial models in Appendix Tables 2-6 also suggest that the probability of employment in regular non-farm activities and non-farm self-employment is significantly higher (relative to agricultural labor) for those with higher per-capita

landholdings. Lanjouw and Stern (1998) argue, on the basis of a detailed village study in Uttar Pradesh, that information networks and ability to pay bribes are important determinants of access to the better-paying and more attractive non-farm jobs. It is possible that per-capita landholdings are proxying such assets here.

V. Poverty Reduction, Agricultural Wages and Non-Farm Employment

We conclude the analysis in this paper by drawing on the considerable variation across NSS regions and over time to bring together the three strands of the analysis: poverty, agricultural labor and non-farm employment. Table 11 presents estimates of two models estimated on the basis of a NSS-region-level panel dataset. We focus here on the three rounds of the NSS data that are considered least problematic from a comparability perspective: 1983, 1993/4 and 2004/5. As noted above the 1987/8 data on agricultural wages are judged to be problematic because the unit-record NSS data cannot be used to replicate the published NSSO data. The 1999/0 data, on the other hand have been argued to suffer from non-comparability of poverty estimates due to changes that had been introduced into the consumption module in that round.

In the first model, we attempt to understand the factors that explain changes in poverty over time. There has been extensive research along these lines undertaken in recent years by Datt and Ravallion (1997, 2002) and Ravallion and Datt (1996, 1999) on the basis of a state-level panel dataset spanning about 40 years and starting in the late 1950s. A consistent message from this literature is that poverty reduction in India falls with higher farm yields, development spending, and non-agricultural output, and that poverty rises with higher inflation. A further observation is that initial conditions also matter: states with higher initial levels of education and infrastructure were observed to achieve more rapid poverty reduction. Although Ravallion and Datt pay close attention to the important role played by non-agricultural output growth on poverty (and note that the elasticity of poverty with respect to non-agricultural output varies considerably by state) the data they analyze do not allow them to focus specifically on the *rural* non-farm sector. The region-level dataset we have constructed from three rounds of NSS data is not as rich that which has been constructed at the state-level, but it does offer an

opportunity to enquire specifically into the relationship between rural poverty and rural non-farm employment (as well as to study the relationship between poverty and agricultural employment and wage rates).

In the first model reported in Table 11 we draw on the three survey rounds to regress the percentage change in poverty on percentage changes in: agricultural wages; agricultural wage employment share; regular non-farm employment share; casual non-farm employment share; non-farm self-employment share; and the proportion of land under irrigation. In addition to these indicators of change over time, we also include as control variables the base year values of the same variables for their respective spells, as well as the base-year headcount rate, a dummy representing the 1993/4-2004/5 spell, and dummies for each of the major Indian states. It is clear that our data do not allow us to control very well for important determinants of poverty reduction such agricultural productivity growth and development spending (it is unlikely that our proxy variable, proportion of land irrigated, can fully capture these effects). As a result, the results in this model have to be viewed as tentative. Nevertheless, the results are suggestive.⁸

From the first model in Table 11 we can see that, all else equal, poverty falls significantly with increases in agricultural wages. Thus the simple correlations identified in Section III are robust to the inclusion of additional control variables. An increase in agricultural wages of 10% is associated with a 3.8% fall in poverty. We also observe that controlling for changes in agricultural wages and employment rates, poverty does not appear to vary with changes in non-farm employment. There is little evidence, here, of poverty reduction being assisted by expansion of non-farm employment opportunities.

Controlling for changes over time, higher initial levels of agricultural wages are also associated with larger reductions in poverty, and the larger the initial share of non-farm self-employment the larger the reduction in poverty. The estimates suggest, further, that poverty fell more sharply in those regions with higher initial levels of poverty. This provides some support to the notion that conditional on other changes and base-year characteristics there was some convergence amongst regions in poverty levels (although

⁸ We attempted to proxy changes at the state level, such as in social spending or subsidies, by interacting our first-spell dummy with each state dummy. These additional controls added very little explanatory power to either of the two models reported in Table 11. The sign and significance of our main variables of interest was also unaffected.

measurement error is very likely to also be playing a role). Relative to Bihar, and controlling for other explanatory variables, states such as Andhra Pradesh, Gujarat, Karnataka, Rajasthan, and West Bengal enjoyed more rapid declines in poverty during our reference period.

In our model of poverty reduction there is only very limited evidence of a poverty-reducing role for the non-farm sector. This is consistent with our earlier analysis indicating that few of the poor appear to gain access to non-farm jobs, and that even on the margin there is little evidence that the poor would participate in an expansion of the non-farm sector.⁹

Does this mean that non-farm employment has no role to play in reducing poverty? One possible route through which non-farm employment influences poverty is via an impact of the non-farm sector on agricultural wages. In our second model we regress the percentage change in agricultural wages on changes and base year employment levels in the non-farm sector, and proportion of land irrigated, using data from our three survey rounds. Again we include as further controls a dummy for the 1993/4-2004/5 spell, and state dummies. This specification is much in the spirit of an earlier analysis by Sheila Bhalla (1993), based on state-level time series data covering the period 1971/2 to 1983/4, in which it was found that non-farm employment exerted a more discernable impact on agricultural wages than did agricultural productivity.¹⁰

In this model we can see that expansion of regular and self-employment in the non-farm sector is positively and significantly correlated with growth in agricultural wages. The observation is consistent with a process of labor market tightening: even if the poor find it difficult to gain access to non-farm employment, the siphoning-off of labor out of agricultural labor and into the non-farm sector, puts pressure on agricultural

⁹ In addition, these findings do not necessarily contradict the earlier cited studies by Ravallion and Datt that point to an important role for non-agricultural output in reducing poverty. The difference is that this study includes agricultural wages as a control. The impact of non-farm employment on agricultural wages is considered in the next regression.

¹⁰ Sharma (2001) also observes a positive impact of non-farm employment shares on agricultural wages from cross-sectional regressions for 1983 and 1993/4 of agricultural wages on productivity per worker, landlessness and non-farm employment shares. Lanjouw and Shariff (2003) obtain similar results from a model based on NCAER data for 1993. They distinguish between types of non-farm employment and observe the most significant relationship between (male) agricultural wages and employment in construction activities. As mentioned above, Eswaran et al (2007) find that while the impact of non-farm employment on agricultural wages is positive, it is only one third as large as the impact of agricultural productivity growth.

wages. This rise in agricultural wages, then helps to reduce overall poverty levels. We find further that agricultural wages tend to rise less rapidly in those regions with high initial wage levels, and with high initial shares of agricultural employment. Conditional on all other variables, the model suggests that wage growth was less rapid during the 1993/4-2004/5 period, relative to 1983-1993/4. Relative to Bihar and controlling for other characteristics, wage growth appears to have been particularly strong in the states of Haryana, Himachal Pradesh, Kerala, Punjab, Tamil Nadu and Uttar Pradesh.

VI. Concluding Comments

This study has examined five quinquennial rounds of National Sample Survey data, covering the period 1983 to 2004/5, to enquire into the extent and speed of poverty decline in rural India during the 1990s, and to explore the inter-relationship between rural poverty, agricultural wage labor employment and the rural non-farm economy. Our main findings can be summarized as follows.

We suggest that while there is clear evidence of declining poverty between 1983 and 2004/5, the pace of reduction has been rather slow. Consistent with earlier studies we find evidence that employment over time in agricultural labor has not shown a clear declining trend, and we find that employment in agricultural labor is strongly correlated with low consumption levels. We have show that agricultural laborers are disproportionately made up of those with no education and low social status. This finding is consistent with the notion that agricultural labor remains a “last resort” option for the rural population – as has often been suggested in the literature. Real wages have been rising over time (continuing a trend that started in the early 1970s), but the rate of increase appears to have slowed substantially between 1999/0 and 2004/5.

Consistent with other researchers we document a sizeable non-agricultural sector in rural India. While this sector appears to have grown in step with overall population growth, we suggest that the non-farm sector only modestly increased its share of total employment during the 1990s. This latter finding appears to be robust within NSS data.

However, studies based on other data sources have suggested that growth in the non-farm sector has been more pronounced (Foster and Rosenzweig, 2003a, b)..

We suggest that non-farm employment comprises three sub-sectors: regular employment, casual employment and self-employment. We document that regular non-farm employment is associated with high consumption levels, but show that those with low education levels, low social status, and low wealth are not well-represented in this sub-sector. Education, social status and wealth seem less relevant for employment in casual non-farm employment, although there is some evidence that lower levels of education are helpful in gaining access to casual non-farm employment. Self-employment in the non-farm sector seems to be particularly heterogeneous, comprising both last resort as well as productive activities. On balance, involvement in this sub-sector also appears to require some education, wealth and social status- perhaps less strongly so in the most recent survey year.

While the picture for India as a whole suggests that there has been no acceleration in the rate of poverty decline or in the rate of diversification out of agriculture, we are able to draw on the marked variation across NSS regions and over time, to pursue the impact of rural diversification on rural poverty. Tentative econometric estimates from a region-level panel dataset covering our reference period indicate that poverty reduction is more clearly associated with changes in agricultural wages and agricultural wage-labor employment levels, than with expansion of non-farm employment opportunities. This does not mean that non-farm employment is not relevant to poverty reduction, however; expansion of non-farm employment, particularly non-farm regular employment and self-employment, displays a significant association with rising agricultural wages.

Thus, policy makers aiming to alleviate poverty should continue to explore options for promoting the non-farm sector. This study suggests that efforts should focus on the promotion of non-farm opportunities that do not impose barriers to entry. These efforts can be expected not only to directly raise the income levels of the poor who gain access to such jobs. They are also likely to contribute to poverty reduction by raising the wages received by those who remain employed as agricultural laborers.

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Table 1: Poverty in Rural India 1983, 1987/88, 1993/4, 2004/5

NSS Region	1983	1987	1993	2004
Andhra Pradesh	26.8	21.0	15.9	10.5
Costal	21.9	17.2	17.1	7.0
Inland Northern	24.1	21.5	13.9	11.0
South-Western	38.7	19.0	20.9	22.4
Inland Southern	46.8	40.8	13.0	11.5
Assam	43.3	39.4	45.2	22.1
Plains Eastern	36.3	35.1	37.1	20.7
Plains Western	47.8	42.9	50.4	22.9
Hills	46.0	26.7	41.4	23.2
Jharkhand	65.6	52.8	62.3	46.2
Bihar	64.7	54.2	56.6	42.6
Northern	66.2	54.8	58.6	41.6
Central	62.3	53.2	53.6	44.1
Gujarat	29.4	28.3	22.2	18.9
Eastern	53.1	34.2	25.5	26.1
Plains Northern	24.8	25.9	23.3	21.6
Plains Southern	29.4	22.8	26.2	17.9
Dry areas	37.0	46.9	26.4	25.0
Saurashtra	13.4	18.3	12.2	2.7
Haryana	22.4	15.3	28.3	13.2
Eastern	23.9	20.4	32.5	12.7
Western	20.4	9.3	22.1	14.1
Himachal Pradesh	17.8	16.7	30.4	10.5
Karnataka	36.2	32.6	30.1	20.7
Coastal Ghats	18.4	12.7	9.0	20.3
Inland Eastern	29.3	23.4	14.5	5.1
Inland Southern	35.8	35.1	29.6	15.1
Inland Northern	42.8	37.7	37.9	27.4
Kerala	39.8	29.3	25.4	13.2
Northern	46.0	37.3	27.8	21.1
Southern	35.5	23.9	23.8	7.5
Chattisgarh	50.7	46.7	44.4	40.8
Madhya Pradesh	49.3	40.1	39.2	36.8
Vindhya	60.9	36.4	36.5	48.0
Central	45.7	44.5	49.4	50.4
Malwa	48.1	37.4	27.8	25.1
South	51.1	51.3	46.4	49.4
South Western	58.7	50.9	67.8	23.8
Northern	26.9	22.9	16.6	22.9

NSS Region	1983	1987	1993	2004
Maharashtra	46.0	40.9	37.9	29.6
Coastal	29.2	29.8	15.2	26.0
Inland Western	38.4	31.5	24.9	9.5
Inland Northern	52.4	45.5	47.3	37.9
Inland Central	51.1	48.3	49.8	42.6
Inland Eastern	58.6	49.5	49.1	33.4
Eastern	46.6	45.6	49.3	47.1
Orissa	68.5	58.7	49.8	46.9
Coastal	58.1	48.5	45.3	27.4
Southern	80.8	83.0	68.8	72.7
Northern	75.2	61.0	45.9	59.1
Punjab	14.4	12.8	11.7	9.0
Northern	16.8	10.6	7.3	4.4
Southern	11.8	16.0	17.4	14.6
Rajasthan	38.6	33.3	26.4	18.3
Western	33.2	27.9	25.3	22.5
North-Eastern	33.5	28.8	17.9	12.7
Southern	61.0	61.1	46.3	30.4
South-Eastern	48.0	31.3	33.9	10.9
Tamil Nadu	56.7	46.3	32.9	23.0
Coastal Northern	65.0	60.7	44.3	28.1
Coastal	58.2	39.5	20.8	13.5
Southern	54.8	51.3	37.2	21.7
Inland	47.4	30.4	22.2	26.7
Uttarakhand	25.1	13.2	24.8	40.6
Uttar Pradesh	48.1	43.6	43.1	33.3
Western	34.1	32.2	29.3	24.1
Central	55.0	44.2	50.2	30.1
Eastern	54.3	50.5	48.8	41.4
Southern	68.9	64.8	67.4	38.9
West Bengal	63.8	48.8	41.2	28.4
Himalayan	73.4	33.9	58.4	20.1
Eastern Plains	63.5	60.5	47.5	42.9
Central Plains	59.8	43.8	31.4	20.1
Western Plains	66.8	47.6	40.7	24.8
All-Rural	46.9	39.6	37.2	28.4

Note: 1999-00 HCRs not reported because of non-comparability with other rounds

Note: Headcount rates are calculated from the respective data rounds, based on the official poverty lines
HCRs for Bihar, UP, and MP prior to 2000 are for the split states

Table 2: Agricultural Wage Employment and Consumption Quintiles 1987-1999

Per Capita Consumption Quintiles	% of working population with primary employment in agricultural wage labor (average “odds”)				
	1983	1987	1993	1999	2004
1	0.496 (1.537)	0.474 (1.495)	0.512 (1.492)	0.520 (1.477)	0.427 (1.417)
2	0.384 (1.192)	0.385 (1.213)	0.402 (1.172)	0.438 (1.246)	0.362 (1.203)
3	0.314 (0.975)	0.311 (0.981)	0.340 (0.992)	0.354 (1.007)	0.311 (1.031)
4	0.254 (0.788)	0.262 (0.825)	0.293 (0.854)	0.287 (0.817)	0.257 (0.853)
5	0.183 (0.567)	0.178 (0.560)	0.200 (0.583)	0.170 (0.482)	0.187 (0.619)
Total	0.322 (1.00)	0.317 (1.00)	0.343 (1.00)	0.352 (1.00)	0.301 (1.00)

**Table 3: Distribution of Occupations by Education and Social Groups
(Adult Male Individuals aged 15 and above)**

	Agricultural labor	Cultivator	Nonfarm regular	Nonfarm casual	Nonfarm self- employed	Farm regular	Not working
<u>1983</u>							
Illiterate	34.9	39.8	2.0	5.4	8.9	4.7	4.4
Upto Primary	20.7	40.8	5.7	6.8	14.7	2.2	9.3
Upto secondary	7.1	33.5	14.5	2.9	10.5	0.5	31.0
Above Secondary	0.9	20.4	46.9	0.4	8.9	0.3	22.2
Non SC/ST	18.5	42.4	7.1	4.6	12.1	2.3	13.0
SC/ST	38.7	28.6	4.8	6.5	7.8	4.8	8.9
Non Muslim	24.3	39.1	6.5	5.0	10.2	3.1	11.8
Muslim	24.7	30.4	5.5	7.1	18.8	2.3	11.3
<u>1987</u>							
Not literate	36.4	35.1	2.0	8.4	8.5	4.1	5.5
Primary completed	20.6	38.7	5.8	8.9	13.5	1.9	10.6
Secondary completed	7.9	31.3	13.3	5.1	10.0	0.5	31.9
University completed	2.5	23.1	39.9	1.6	9.4	0.2	23.5
Non SC/ST	18.6	39.0	7.5	6.9	11.5	1.9	14.8
SC/ST	37.8	25.6	4.6	9.2	7.7	4.0	11.2
Non Muslim	24.3	35.6	6.7	7.3	9.7	2.7	13.8
Muslim	24.5	28.8	5.6	10.3	16.9	1.1	12.9
<u>1993</u>							
Not literate	40.3	35.5	1.9	7.1	9.2	1.8	4.2
Primary completed	24.3	38.4	4.9	9.0	14.5	0.9	8.0
Secondary completed	11.0	32.4	10.2	5.5	12.3	0.5	28.1
University completed	4.0	26.7	25.7	1.5	10.8	0.5	30.9
Non SC/ST	19.0	39.0	7.4	5.9	13.1	1.0	14.6
SC/ST	41.2	25.3	4.8	8.8	8.1	1.3	10.5
Non Muslim	26.0	35.5	6.7	6.6	10.7	1.2	13.4
Muslim	22.8	28.2	5.8	8.7	21.2	0.7	12.8

	Agricultural labor	Cultivator	Nonfarm regular	Nonfarm casual	Nonfarm self- employed	Farm regular	Not working
<u>1999</u>							
Not literate	42.2	31.5	1.8	8.4	9.9	1.4	5.0
Primary completed	26.6	33.2	4.7	10.4	14.1	1.2	9.8
Secondary completed	12.9	30.9	9.5	7.5	12.6	0.6	25.9
University completed	5.0	27.4	23.9	2.1	13.2	0.6	27.8
Non SC/ST	19.8	35.4	7.6	7.0	13.7	1.0	15.5
SC/ST	39.2	23.0	5.2	10.3	8.6	1.2	12.6
Non Muslim	26.2	32.3	6.9	7.8	11.0	1.1	14.6
Muslim	23.8	22.2	6.0	10.6	22.4	0.6	14.4
<u>2004</u>							
Not literate	35.9	32.5	2.2	11.6	11.8	1.3	4.9
Primary completed	24.2	33.8	4.9	11.9	15.6	0.8	8.7
Secondary completed	12.4	31.4	8.8	8.1	14.9	0.4	24.1
University completed	4.3	27.1	22.9	2.6	16.8	0.3	26.0
Non SC/ST	16.9	35.2	7.9	7.9	16.2	0.7	15.2
SC/ST	32.7	24.6	5.9	13.3	10.2	1.0	12.3
Non Muslim	21.9	32.9	7.5	9.5	13.2	0.8	14.3
Muslim	20.7	22.8	5.7	10.7	24.9	0.4	14.8

Table 4: Distribution of Occupation in Rural India (Individuals Aged 15 and above)

	Male					Female				
	1983	1987	1993	1999	2004	1983	1987	1993	1999	2004
Agricultural labor	24.3	24.3	25.7	26.0	21.8	17.0	15.8	16.7	17.2	15.5
Cultivator	38.4	35.0	34.8	31.4	31.9	16.4	16.0	13.6	13.2	14.7
Nonfarm regular	6.4	6.6	6.6	6.8	7.3	1.0	1.1	1.1	1.2	1.6
Nonfarm casual	5.2	7.6	6.8	8.1	9.6	1.9	3.7	1.8	1.8	2.0
Nonfarm selfemployed	10.9	10.3	11.6	12.1	14.4	3.2	2.4	3.0	3.5	4.1
Farm regular	3.0	2.5	1.1	1.1	0.8	0.5	0.8	0.2	0.3	0.2
Not working	11.8	13.7	13.3	14.6	14.3	60.1	60.3	63.5	62.9	62.0

Table 5: Employment Share among Economically Active Adult Population: 1983 – 2004/5

State	Agricultural Labor	Cultivator	Casual Nonfarm	Regular Nonfarm	Nonfarm Self-Employe	Farm Regular	Total Agricultural Sector	Total Nonfarm Sector
<u>1983</u>								
All India	32.2	42.8	5.8	5.5	11.0	2.7	77.7	22.3
Andhra Pradesh	43.6	30.2	5.0	4.3	13.9	3.1	76.9	23.1
Assam	12.3	47.5	8.0	8.3	10.4	13.6	73.3	26.7
Bihar	44.4	36.3	3.2	2.0	12.4	1.7	82.4	17.6
Gujarat	34.9	46.2	5.6	5.5	6.9	1.0	82.1	18.0
Haryana	21.5	44.9	12.9	5.3	10.2	5.3	71.7	28.3
HP	8.4	75.3	6.0	4.5	5.2	0.5	84.3	15.8
Karnataka	39.8	38.8	4.2	7.5	7.9	1.8	80.4	19.6
Kerala	30.6	9.7	13.7	23.6	18.5	3.9	44.2	55.8
Madhya Pradesh	23.2	60.6	4.5	2.7	6.3	2.7	86.5	13.5
Maharashtra	39.5	40.3	5.4	4.7	6.7	3.4	83.2	16.8
Orissa	37.5	34.2	4.8	4.1	15.5	3.9	75.6	24.4
Punjab	24.9	43.7	9.4	4.5	12.4	5.1	73.7	26.3
Rajasthan	15.4	66.6	4.0	5.2	7.7	1.1	83.1	16.9
Tamil Nadu	46.1	23.3	7.9	7.9	13.3	1.5	70.9	29.1
Uttar Pradesh	18.9	58.5	4.4	3.6	13.1	1.7	79.0	21.0
West Bengal	35.9	28.5	8.6	8.4	15.4	3.3	67.6	32.4
Jharkhand	29.3	44.7	6.8	6.2	10.6	2.5	76.4	23.6
Chattisgarh	32.7	54.9	2.8	2.2	3.5	4.0	91.6	8.4
Uttarakhand	6.8	71.1	7.3	6.5	8.0	0.2	78.1	21.9
<u>1987</u>								
All India	31.8	40.5	6.1	8.9	10.1	2.6	74.9	25.2
Andhra Pradesh	42.4	30.3	4.5	10.2	10.8	1.9	74.6	25.4
Assam	13.9	44.7	9.1	13.4	9.6	9.3	67.9	32.2
Bihar	40.3	39.5	3.5	3.7	10.0	3.1	82.8	17.2
Gujarat	35.4	31.8	7.5	17.1	5.3	3.0	70.2	29.9
Haryana	18.9	50.7	8.6	7.1	12.7	2.0	71.7	28.4
Himachal Pradesh	5.8	71.3	6.5	9.6	6.8	0.0	77.1	22.9
Karnataka	42.4	33.5	4.9	9.5	7.7	2.1	78.0	22.0
Kerala	30.3	8.4	13.4	30.2	16.7	1.1	39.7	60.3
Madhya Pradesh	22.6	56.5	3.6	4.5	7.3	5.6	84.7	15.3
Maharashtra	39.3	38.6	6.9	6.1	6.6	2.5	80.4	19.6
Orissa	36.1	32.7	5.7	10.2	13.3	2.0	70.8	29.2
Punjab	24.4	36.2	12.2	6.1	14.6	6.5	67.1	32.9
Rajasthan	17.1	52.4	4.2	14.4	10.8	1.1	70.6	29.4
Tamil Nadu	43.1	23.7	10.6	9.9	11.7	1.0	67.9	32.2
Uttar Pradesh	21.7	57.0	4.2	5.1	10.7	1.4	80.1	20.0
West Bengal	34.6	30.3	8.2	8.1	17.0	1.8	66.7	33.3
Jharkhand	22.8	41.4	6.6	11.4	9.0	8.9	73.0	27.0
Chattisgarh	35.0	51.5	3.3	3.1	4.2	2.8	89.4	10.6
Uttarakhand	5.0	75.4	7.1	6.5	5.1	0.8	81.2	18.8

State	Agricultural Labor	Cultivator	Casual Nonfarm	Regular Nonfarm	Nonfarm Self-Employe	Farm Regular	Total Agricultural Sector	Total Nonfarm Sector
<u>1993</u>								
All India	34.4	39.4	6.3	7.0	11.9	1.1	74.8	25.2
Andhra Pradesh	46.1	28.8	4.3	5.2	14.5	1.1	76.0	24.0
Assam	15.9	40.8	7.7	15.0	11.2	9.5	66.2	33.8
Bihar	46.2	37.9	3.1	1.6	10.6	0.7	84.7	15.3
Gujarat	41.6	33.1	7.5	8.8	8.6	0.4	75.1	24.9
Haryana	19.0	41.1	13.0	10.9	15.3	0.7	60.9	39.2
Himachal Pradesh	7.7	65.3	9.5	8.9	8.2	0.4	73.4	26.6
Karnataka	39.6	37.4	5.0	5.4	11.9	0.8	77.8	22.2
Kerala	27.5	5.2	13.1	34.8	18.5	1.0	33.7	66.3
Madhya Pradesh	32.5	53.4	3.8	3.7	5.2	1.4	87.3	12.7
Maharashtra	43.2	35.5	7.1	4.7	8.0	1.5	80.2	19.8
Orissa	39.7	36.8	4.5	4.3	14.1	0.6	77.1	22.9
Punjab	29.0	34.9	11.8	7.3	14.7	2.2	66.1	33.9
Rajasthan	16.1	57.6	5.0	11.8	8.7	0.8	74.4	25.6
Tamil Nadu	45.1	21.7	9.9	9.2	13.4	0.7	67.5	32.5
Uttar Pradesh	21.3	55.1	4.9	4.9	13.3	0.5	77.0	23.0
West Bengal	31.0	28.2	9.6	9.3	20.6	1.4	60.6	39.4
Jharkhand	31.8	44.7	6.3	6.2	11.0	0.1	76.5	23.5
Chattisgarh	34.6	54.7	3.3	2.6	4.5	0.3	89.6	10.4
Uttarakhand	16.7	64.9	6.7	5.2	6.1	0.5	82.0	18.0
<u>1999</u>								
All India	35.2	36.4	6.6	8.0	12.8	1.1	72.7	27.3
Andhra Pradesh	47.4	27.8	5.5	5.3	13.3	0.8	75.9	24.1
Assam	9.1	37.4	9.0	18.4	14.2	11.9	58.4	41.6
Bihar	47.1	34.1	2.6	2.7	13.2	0.3	81.5	18.5
Gujarat	40.0	34.7	7.2	8.8	9.0	0.3	75.0	25.0
Haryana	17.7	40.5	15.3	10.4	15.0	1.1	59.3	40.7
Himachal Pradesh	8.7	54.0	13.5	13.5	9.9	0.6	63.2	36.8
Karnataka	40.8	35.5	5.0	8.2	9.9	0.7	76.9	23.1
Kerala	21.7	3.9	13.8	38.3	19.4	2.9	28.5	71.5
Madhya Pradesh	35.0	48.3	3.7	5.2	7.2	0.6	83.9	16.1
Maharashtra	44.4	34.0	7.5	5.7	7.4	1.0	79.4	20.6
Orissa	45.5	30.1	4.9	5.7	13.5	0.5	76.0	24.0
Punjab	22.7	33.6	12.8	10.6	15.1	5.1	61.5	38.5
Rajasthan	15.7	56.0	5.7	11.0	11.2	0.4	72.1	27.9
Tamil Nadu	45.8	17.6	11.8	10.0	14.0	0.9	64.2	35.8
Uttar Pradesh	21.0	50.6	6.1	6.3	15.5	0.6	72.2	27.8
West Bengal	34.7	25.4	5.9	8.7	23.6	1.8	61.8	38.2
Jharkhand	23.1	46.3	6.5	11.1	12.6	0.3	69.8	30.2
Chattisgarh	42.7	45.4	3.4	3.2	5.1	0.2	88.3	11.7
Uttarakhand	13.2	62.2	8.6	5.7	10.0	0.3	75.7	24.3

State	Agricultural Labor	Cultivator	Casual Nonfarm	Regular Nonfarm	Nonfarm Self-Employe	Farm Regular	Total Agricultural Sector	Total Nonfarm Sector
<u>2004</u>								
All India	30.1	37.6	7.2	9.3	14.9	0.8	68.5	31.5
Andhra Pradesh	43.2	25.7	6.6	7.2	16.5	0.9	69.7	30.3
Assam	10.0	50.4	6.0	12.9	15.8	4.9	65.3	34.7
Bihar	35.9	39.1	2.9	3.1	18.9	0.1	75.1	24.9
Gujarat	39.2	34.0	8.1	8.1	10.3	0.4	73.5	26.5
Haryana	20.5	30.6	17.2	11.7	18.5	1.4	52.6	47.4
HP	8.2	53.6	14.9	12.7	10.4	0.2	62.0	38.0
Karnataka	45.4	33.0	5.1	7.3	9.0	0.2	78.6	21.4
Kerala	17.7	3.6	18.0	36.5	22.9	1.3	22.6	77.4
Madhya Pradesh	29.9	49.8	4.9	5.8	8.9	0.7	80.5	19.5
Maharashtra	39.0	37.7	7.9	5.0	9.4	1.0	77.7	22.3
Orissa	31.2	31.9	6.4	9.1	21.1	0.3	63.4	36.6
Punjab	22.1	27.4	17.5	15.0	16.1	1.9	51.5	48.5
Rajasthan	14.1	53.7	6.4	13.1	12.5	0.2	68.0	32.0
Tamil Nadu	41.5	20.6	10.6	12.5	14.5	0.3	62.4	37.6
Uttar Pradesh	15.3	50.9	6.6	8.8	18.0	0.4	66.6	33.4
West Bengal	30.8	25.9	6.6	10.4	24.2	2.2	58.8	41.2
Jharkhand	11.7	53.4	4.7	16.0	14.1	0.1	65.2	34.8
Chattisgarh	38.4	46.1	4.1	5.5	5.8	0.2	84.7	15.4
Uttarakhand	16.4	56.1	8.8	6.3	11.9	0.5	73.1	26.9

Note: Economically active adult population is defined as those who are between 15 and 60 years of age and engaged in work such as all the market activities for pay or profits (except prostituted, begging, smuggling etc.) and non-market activities relating to the agricultural sector for own consumption and construction of private or community facilities free of charge. Non-farm employment is defined as workers in sectors other than agriculture by using industry code. Employment status is defined in NSS as following. Regular salaried employee is a person who gets in return salary or wages on a regular basis but not on daily basis, casual wage labor is a person who earn wage according to the terms of the daily or periodic work contract, and self-employed are persons who operate their own farm or non-farm enterprises.

Table 6: Real Agricultural Wage (Daily, Rs. 1993 State-Level prices)

	1983	1987	1993	1999	2004	Percent Change			
						1983-87	1987-93	1993-99	1999-04
AP	10.9	10.6	15.0	18.5	16.5	-2.6	41.2	23.6	-10.9
Assam	18.3	22.1	25.0	25.3	35.4	20.9	13.2	1.3	39.7
Bihar	12.3	14.0	15.7	21.8	24.1	14.2	11.9	38.9	10.2
Chhattisgarh	8.9	10.8	12.0	14.9	14.7	20.8	11.2	24.2	-1.3
Gujarat	13.9	17.5	20.0	21.5	22.4	25.7	14.4	7.4	4.4
Haryana	29.0	19.1	30.0	38.3	43.7	-34.1	57.0	27.7	14.1
HP	8.3	15.0	30.0	42.3	56.2	81.8	100.0	41.1	32.8
Jharkhand	11.8	17.6	18.0	22.8	24.1	48.3	2.6	26.4	5.7
Karnataka	9.0	8.9	15.0	18.1	19.6	-0.9	67.8	20.3	8.4
Kerala	27.0	28.0	35.0	51.4	57.1	3.6	25.2	47.0	11.1
Maharashtra	8.9	12.0	15.0	15.5	15.6	34.1	25.3	3.5	0.7
MP	9.4	8.4	15.0	18.0	17.7	-10.6	77.9	20.0	-1.9
Orissa	9.6	8.0	15.0	15.0	17.8	-16.3	87.6	0.1	18.6
Punjab	30.5	27.3	42.9	43.8	43.7	-10.4	57.0	2.1	-0.1
Rajasthan	15.7	18.6	25.0	31.1	33.2	18.5	34.4	24.4	6.7
TN	10.1	10.0	20.0	24.9	27.0	-0.5	99.6	24.3	8.7
UP	12.5	13.0	20.0	21.3	28.9	4.3	53.6	6.7	35.6
Uttarakhand	31.2	24.2	30.0	32.3	32.2	-22.5	24.1	7.8	-0.3
WB	14.8	17.0	22.5	25.5	25.7	15.4	32.1	13.4	0.8

Note: Agricultural wage is calculated by taking means of all wages of workers involving agricultural casual operations such as ploughing, sowing, transplanting, weeding, harvesting, and other cultivation activities. State-specific CPIALs used for adjusting cost of living differences. Percent change in the last 4 columns is calculated by $(\text{wage}_t - \text{wage}_{t-1}) / \text{wage}_{t-1}$.

Table 7a: Region-level Correlations of Agricultural Wages and Poverty (Levels)

Region-level poverty estimates	Year-specific Region-Level Agricultural Wages	
	Pearson Correlation (prob val)	Spearman Rank Correlation (prob val)
1983	-0.4890 (0.000)	-0.3672 (0.004)
1987/8	-0.4093(0.001)	-0.3844 (0.003)
1993/4	-0.4813 (0.000)	-0.4493 (0.000)
2004/5	-0.4783 (0.000)	-0.4598 (0.000)

Table 7b: Region-level Correlations of Changes in Agricultural Wages and Changes in Poverty

Changes in Region-level poverty estimates	Changes in Region-Level Agricultural Wages	
	Pearson Correlation (prob val)	Spearman Rank Correlation (prob val)
1983	0.0617 (0.6424)	00633 (0.6340)
1987-1993	0.0855 (0.5195)	-0.2126 (0.106)
1993-2004	-0.3401 (0.009)	-0.2516 (0.0569)

Table 8a: Regular Non-Farm Employment and Consumption Quintiles 1983-2004/5

Per Capita Consumption Quintiles	% of working population with primary employment in regular non-farm employment (average "odds")				
	1983	1987	1993	1999	2004
1	0.023 (0.403)	0.023 (0.374)	0.021 (0.342)	0.022 (0.332)	0.027 (0.378)
2	0.036 (0.618)	0.030 (0.500)	0.031 (0.493)	0.034 (0.516)	0.036 (0.504)
3	0.047 (0.804)	0.044 (0.717)	0.045 (0.713)	0.044 (0.671)	0.051 (0.710)
4	0.063 (1.084)	0.065 (1.068)	0.067 (1.078)	0.070 (1.062)	0.073 (1.010)
5	0.115 (1.993)	0.134 (2.207)	0.137 (2.200)	0.156 (2.377)	0.155 (2.150)
Total	0.058 (1.00)	0.061 (1.00)	0.062 (1.00)	0.066 (1.00)	0.072 (1.00)

Table 8b: Casual Non-Farm Wage Employment by Quintile 1983-2004

Per Capita Consumption Quintiles	% of working population with primary employment in casual non-farm employment (average "odds")				
	1983	1987	1993	1999	2004
1	0.059 (1.071)	0.094 (1.058)	0.073 (1.037)	0.084 (1.046)	0.110 (1.178)
2	0.060 (1.085)	0.089 (1.005)	0.081 (1.156)	0.084 (1.044)	0.108 (1.178)
3	0.060 (1.077)	0.095 (1.068)	0.071 (1.021)	0.082 (1.015)	0.102 (1.091)
4	0.052 (0.944)	0.094 (1.055)	0.068 (0.979)	0.080 (1.000)	0.084 (0.901)
5	0.046 (0.839)	0.074 (0.827)	0.058 (0.830)	0.072 (0.897)	0.069 (0.738)
Total	0.055 (1.00)	0.089 (1.00)	0.070 (1.00)	0.080 (1.00)	0.093 (1.00)

Table 8c: Non-Farm Self-Employment by Quintile 1983-2004

Per Capita Consumption Quintiles	% of working population self-employed in the non-farm sector (average "odds")				
	1983	1987	1993	1999	2004
1	0.091 (0.831)	0.074 (0.733)	0.086 (0.726)	0.098 (0.765)	0.130 (0.869)
2	0.104 (0.948)	0.093 (0.922)	0.106 (0.891)	0.118 (0.924)	0.134 (0.898)
3	0.114 (1.037)	0.104 (1.025)	0.119 (0.999)	0.127 (1.000)	0.145 (0.973)
4	0.118 (1.073)	0.115 (1.137)	0.129 (1.082)	0.137 (1.075)	0.156 (1.045)
5	0.120 (1.095)	0.116 (1.148)	0.149 (1.249)	0.156 (1.223)	0.174 (1.169)
Total	0.110 (1.00)	0.101 (1.00)	0.119 (1.00)	0.128 (1.00)	0.149 (1.00)

Table 9 Predicted Probabilities of Access to Occupations (evaluated at mean characteristics)

	Agricultural labor	Cultivator	Nonfarm regular	Nonfarm casual labor	Nonfarm self-employed	Farm regular	Not working
<u>1983</u>							
SC/ST	34.6	32.4	5.7	5.7	7.3	4.7	9.5
non SC/ST	23.4	42.5	5.3	5.1	11.8	3.2	8.6
Muslim	27.5	33.5	5.3	6.3	14.2	2.9	10.3
non Muslim	27.0	40.1	5.4	5.2	10.0	3.7	8.6
<u>1987</u>							
SC/ST	34.0	29.2	5.5	8.7	7.4	3.8	11.5
non SC/ST	23.7	38.6	5.7	7.6	11.0	2.6	10.7
Muslim	27.1	36.2	5.6	7.7	9.4	3.2	10.8
non Muslim	24.9	40.6	5.4	5.5	6.3	7.5	9.6
<u>1993</u>							
SC/ST	36.7	29.5	5.8	7.8	7.9	1.2	11.1
non SC/ST	25.0	38.7	5.6	6.4	12.2	1.4	10.6
Muslim	25.8	31.2	6.1	8.0	16.1	0.7	12.0
non Muslim	29.4	36.2	5.6	6.7	10.2	1.4	10.5
<u>1999</u>							
SC/ST	36.6	26.8	5.7	9.0	8.4	1.1	12.4
non SC/ST	26.3	34.6	5.7	7.4	12.7	1.3	12.0
Muslim	30.3	32.7	5.6	7.7	10.5	1.2	11.9
non Muslim	31.1	39.9	4.9	5.7	5.8	2.4	10.2
<u>2004</u>							
SC/ST	30.7	29.1	5.9	11.5	9.8	0.7	12.3
non SC/ST	22.2	35.5	5.6	8.5	14.8	0.8	12.6
Muslim	23.4	27.6	5.6	9.9	19.4	0.5	13.6
non Muslim	25.4	34.0	5.6	9.5	12.3	0.8	12.3

Note: Employment probabilities are predicted after estimating multinomial logit model of 6 broad occupation categories on individual's characteristics such as age, educational status, and caste, and household's characteristics such as per capita land holdings and the number of household members. The regression results are provided in Appendix. The probabilities for SC/ST, for example, are predicted by assuming that the population belong to entirely SC/ST.

Table 10 Predicted Probabilities of Access to Occupations (evaluated at mean characteristics)

	Agricultural labor	Cultivator	Nonfarm regular	Nonfarm casual labor	Nonfarm self- employed	Farm regular	Not working
<u>1983</u>							
Not literate	29.9	41.0	2.8	5.1	9.1	4.2	7.9
Primary completed	16.6	37.3	9.2	6.2	14.6	1.5	14.7
Secondary completed	4.5	23.9	29.1	1.4	9.9	0.5	30.7
University completed	1.5	13.4	43.3	0.6	8.2	0.3	32.8
<u>1987</u>							
Not literate	30.8	36.9	2.7	8.0	8.6	3.5	9.4
Primary completed	16.9	35.3	9.1	7.9	13.9	1.4	15.5
Secondary completed	6.0	24.4	25.4	3.6	10.4	0.5	29.6
University completed	2.8	14.6	37.8	1.5	8.6	0.6	34.1
<u>1993</u>							
Not literate	33.2	37.8	2.6	6.8	9.6	1.6	8.4
Primary completed	19.4	35.9	8.1	9.0	14.9	0.6	12.1
Secondary completed	8.5	26.6	20.9	3.6	12.3	0.4	27.8
University completed	3.0	15.0	37.0	0.6	10.5	0.5	33.5
<u>1999</u>							
Not literate	34.8	33.6	2.7	8.2	10.0	1.3	9.5
Primary completed	20.5	32.2	8.2	10.3	14.7	1.1	13.0
Secondary completed	9.7	26.7	17.6	5.2	13.9	0.7	26.1
University completed	2.9	16.6	32.9	1.7	12.7	0.4	32.8
<u>2004</u>							
Not literate	19.0	35.7	7.9	10.4	16.0	0.5	10.5
Primary completed	16.3	34.6	7.9	10.1	16.3	0.3	14.5
Secondary completed	8.7	29.8	13.8	5.2	17.5	0.2	24.8
University completed	4.0	16.3	30.1	2.1	19.0	0.4	28.2

Note: Employment probabilities are predicted after estimating multinomial logit model of 6 broad occupation categories on individual's characteristics such as age, educational status, and caste, and household's characteristics such as per capita land holdings and the number of household members. The regression results are provided in Appendix. The probabilities for education level with secondary, for example, are predicted by assuming that the population belong to entirely secondary education.

Table 11: Correlates of Poverty Reduction and Agricultural Wage Growth Multivariate OLS

	% Change in Regional Headcounts (1983-1993 and 1993 -2004)		% Change in Regional Agricultural Wages (1983-1993 and 1993-2005)	
<i>% change in</i>		(prob val)		(prob val)
Agricultural wages	-0.386	0.017**	-	-
Agricultural wage labor	-0.027	0.744	-0.053	0.332
Regular NF employment	0.054	0.449	0.096	0.040**
Casual NF employment	0.001	0.979	-0.003	0.868
NF Self employment	0.016	0.814	0.127	0.005***
Proportion of land irrigated	0.001	0.786	-0.005	0.035**
<i>Region-level Base-year Controls</i>				
Agricultural wages	-0.025	0.050**	-0.047	0.000***
Agricultural wage employment	-0.070	0.914	-1.427	0.000***
Regular NF employment	-0.668	0.675	-0.710	0.497
Casual NF employment	-0.040	0.973	0.529	0.489
NF Self employment	2.760	0.050**	1.010	0.278
Proportion of land irrigated	-0.218	0.354	0.091	0.550
Headcount rate	-1.202	0.002***	-	-
1993-2004 Dummy	0.021	0.882	-0.304	0.001***
<i>State Dummies (Bihar omitted)</i>				
Andhra Pradesh	-0.791	0.001***	0.005	0.969
Assam	-0.196	0.416	0.239	0.130
Gujarat	-0.412	0.024**	0.008	0.935
Haryana	0.027	0.915	0.456	0.005***
Himachal Pradesh	0.354	0.295	1.282	0.000***
Karnataka	-0.428	0.039**	0.112	0.314
Kerala	-0.258	0.386	0.710	0.000***
Madhya Pradesh	-0.118	0.423	-0.084	0.378
Maharashtra	-0.267	0.129	0.006	0.953
Orissa	-0.184	0.319	-0.093	0.450
Punjab	-0.056	0.843	0.708	0.000***
Rajasthan	-0.308	0.068*	0.051	0.650
Tamil Nadu	-0.340	0.114	0.365	0.007***
Uttar Pradesh	-0.149	0.433	-0.252	0.039**
West Bengal	-0.291	0.077*	0.089	0.410
Intercept	1.004	0.020**	1.452	0.000***
<i>No of Observations</i>	116		116	
<i>Adjusted R²</i>	0.101		0.651	

Notes

1. *** significant at 1%, ** significant at 5%, * significant at 10%,

Appendix Table 1: Descriptive Statistics for Male Adult Occupation Choice

	1983	1987	1993	1999	2004
Age	32.86 (13.01)	32.67 (12.91)	32.81 (12.92)	32.89 (12.75)	33.18 (12.76)
Literate but below primary	0.13 (0.34)	0.14 (0.34)	0.14 (0.34)	0.12 (0.33)	0.12 (0.33)
Primary completed	0.15 (0.36)	0.15 (0.36)	0.14 (0.34)	0.13 (0.34)	0.16 (0.36)
Middle completed	0.13 (0.34)	0.14 (0.35)	0.16 (0.37)	0.19 (0.39)	0.20 (0.40)
Secondary completed	0.08 (0.27)	0.10 (0.30)	0.14 (0.35)	0.17 (0.37)	0.17 (0.38)
University completed	0.02 (0.12)	0.02 (0.14)	0.03 (0.17)	0.03 (0.18)	0.05 (0.22)
SC/ST	0.29 (0.45)	0.30 (0.46)	0.30 (0.46)	0.32 (0.47)	0.31 (0.46)
Muslim	0.08 (0.27)	1.09 (0.32)	0.09 (0.28)	1.09 (0.29)	0.10 (0.30)
Number of household members	5.30 (2.66)	5.37 (2.52)	5.15 (2.34)	5.29 (2.46)	4.95 (2.37)
Per capita land owned (ha.)	0.25 (1.15)	0.23 (0.58)	0.20 (0.46)	0.16 (0.38)	0.16 (0.38)
Number of observations	100346	108457	93279	95597	97184

Note: Numbers in the parentheses are standard deviation.

Note: hhsz and pcland produced with hhold weights and one obs per hhold

Appendix Table 2: Occupational Choice by Multinomial Logit Model in 1983

	Not working	Cultivator	Nonfarm regular	Nonfarm casual	Nonfarm selfemployed	Farm regular
Age	-0.597 (83.97)	0.022 (5.01)	0.175 (20.15)	0.014 (1.77)	0.029 (5.09)	-0.046 (4.96)
Age squared	0.008 (82.58)	0.000 (0.07)	-0.002 (15.18)	0.000 (3.14)	0.000 (1.20)	0.000 (2.58)
Literate but below primary	0.500 (9.88)	0.253 (9.32)	1.222 (22.30)	0.579 (13.48)	0.785 (23.15)	-0.260 (4.30)
Primary completed	1.577 (37.64)	0.564 (20.04)	1.970 (38.42)	0.822 (18.95)	1.155 (33.49)	-0.443 (6.43)
Middle completed	3.038 (67.64)	1.054 (28.87)	3.054 (55.79)	0.930 (16.17)	1.580 (36.19)	-1.052 (8.43)
Secondary completed	4.347 (63.26)	1.456 (22.80)	4.787 (66.67)	0.676 (5.89)	2.176 (30.88)	-0.159 (0.98)
University completed	5.465 (24.28)	1.861 (8.29)	6.303 (28.65)	0.867 (2.19)	3.095 (13.43)	0.342 (0.70)
SC/ST	-0.368 (11.42)	-0.799 (39.36)	-0.419 (11.16)	-0.285 (8.48)	-0.907 (31.84)	-0.030 (0.75)
Muslim	0.201 (4.00)	-0.266 (7.76)	-0.010 (0.17)	0.195 (3.76)	0.348 (9.12)	-0.309 (3.79)
Number of household members	0.118 (25.76)	0.157 (46.52)	0.019 (3.41)	0.024 (4.00)	0.072 (16.35)	0.039 (5.28)
Per capita land owned (ha.)	3.071 (50.53)	3.976 (74.47)	1.551 (19.15)	-1.770 (12.88)	-0.942 (10.31)	2.360 (26.54)
Constant	5.796 (52.91)	-1.962 (24.70)	-6.751 (42.06)	-1.779 (13.34)	-2.302 (21.94)	-1.392 (8.71)
Number of observations	100346					
log likelihood	-					
Pseudo R2	131166.0					
	0.2027					

Sample: Rural, Males, 15 to 60 years
 Absolute value of z statistics in parentheses

Appendix Table 3: Occupational Choice by Multinomial Logit Model in 1987

	Not working	Cultivator	Nonfarm regular	Nonfarm casual	Nonfarm selfemployed	Farm regular
Age	-0.600 (91.41)	0.018 (4.09)	0.183 (21.89)	0.001 (0.18)	0.101 (16.76)	-0.030 (3.03)
Age squared	0.008 (88.05)	0.000 (1.04)	-0.002 (16.65)	0.000 (2.89)	-0.001 (12.34)	0.000 (1.52)
Literate but below primary	0.483 (10.46)	0.419 (15.96)	1.330 (25.26)	0.460 (12.53)	0.793 (23.61)	-0.207 (3.30)
Primary completed	1.413 (36.69)	0.650 (23.78)	2.002 (40.17)	0.632 (16.95)	1.171 (34.48)	-0.342 (4.88)
Middle completed	2.624 (64.61)	1.065 (31.22)	2.934 (55.45)	0.842 (18.24)	1.549 (37.23)	-0.935 (7.80)
Secondary completed	3.724 (68.58)	1.334 (26.65)	4.401 (73.16)	0.910 (13.09)	2.002 (35.19)	-0.373 (2.51)
University completed	4.637 (33.03)	1.466 (10.49)	5.558 (40.47)	0.771 (3.65)	2.568 (17.50)	0.652 (2.30)
SC/ST	-0.357 (12.41)	-0.777 (39.18)	-0.542 (15.19)	-0.244 (8.81)	-0.821 (29.81)	-0.021 (0.51)
Muslim	0.054 (1.24)	-0.236 (7.41)	-0.013 (0.24)	0.244 (5.96)	0.326 (9.08)	-0.957 (9.17)
Number of household members	0.122 (27.33)	0.173 (50.04)	0.019 (3.27)	0.049 (9.61)	0.081 (17.92)	0.058 (7.29)
Per capita land owned (ha.)	2.523 (44.54)	3.609 (72.32)	0.941 (11.96)	0.216 (2.57)	-0.398 (4.90)	1.371 (12.95)
Constant	6.324 (55.52)	-1.853 (21.14)	-6.836 (40.90)	-1.627 (13.33)	-4.095 (34.42)	-0.907 (4.39)
Number of observations	108385					
	-					
log likelihood	146682.7					
Pseudo R2	0.197					

Sample: Rural, Males, 15 to 60 years
 Absolute value of z statistics in parentheses

Appendix Table 4: Occupational Choice by Multinomial Logit Model in 1993

	Not working	Cultivator	Nonfarm regular	Nonfarm casual	Nonfarm selfemployed	Farm regular
Age	-0.676 (86.81)	0.001 (0.13)	0.156 (17.53)	0.027 (3.82)	0.054 (8.92)	-0.015 (0.95)
Age squared	0.009 (82.77)	0.000 (4.40)	-0.001 (12.38)	-0.001 (5.41)	0.001 (6.18)	0.000 (0.59)
Literate but below primary	0.362 (6.56)	0.283 (9.89)	1.155 (19.09)	0.516 (12.70)	0.735 (20.90)	-0.190 (2.02)
Primary completed	1.176 (24.55)	0.574 (18.70)	1.833 (31.29)	0.853 (20.58)	1.067 (28.89)	-0.453 (3.87)
Middle completed	2.459 (55.41)	0.902 (27.36)	2.688 (47.92)	0.947 (20.69)	1.433 (36.76)	-0.302 (2.43)
Secondary completed	3.776 (73.09)	1.206 (28.18)	4.027 (68.81)	0.836 (12.97)	1.847 (38.10)	-0.046 (0.30)
University completed	5.071 38.26	1.560 (12.14)	5.646 (44.14)	0.041 (0.15)	2.727 (20.82)	1.254 (4.44)
SC/ST	-0.452 (14.04)	-0.838 (38.62)	-0.507 (13.42)	-0.210 (6.83)	-0.882 (30.88)	-0.591 (8.63)
Muslim	0.346 (6.79)	-0.050 (1.37)	0.308 (5.19)	0.331 (6.73)	0.628 (16.36)	-0.602 (4.17)
Number of household members	0.131 (24.30)	0.198 (48.33)	0.027 (3.98)	0.032 (5.00)	0.105 (20.87)	0.019 (1.37)
Per capita land owned (ha.)	4.224 (55.04)	5.487 (79.43)	2.594 (26.80)	-0.356 (2.73)	0.695 (7.09)	2.645 (14.38)
Constant	7.105 (59.80)	-2.131 (24.55)	-6.848 (40.81)	-2.014 (15.81)	-3.017 (27.21)	-2.799 (10.19)
Number of observations	93274					
	-					
log likelihood	119085.6					
Pseudo R2	0.225					

Sample: Rural, Males, 15 to 60 years

Absolute value of z statistics in parentheses

Appendix Table 5: Occupational Choice by Multinomial Logit Model in 1999

	Not working	Cultivator	Nonfarm regular	Nonfarm casual	Nonfarm selfemployed	Farm regular
Age	-0.689 (94.81)	0.012 (2.41)	0.095 (11.24)	0.041 (5.90)	0.077 (12.61)	0.055 (3.28)
Age squared	0.009 (90.71)	0.000 (2.43)	-0.001 (5.71)	-0.001 (7.88)	-0.001 (9.43)	-0.001 (3.14)
Literate but below primary	0.390 (7.37)	0.277 (9.27)	1.188 (18.45)	0.478 (12.16)	0.629 (17.40)	0.120 (1.23)
Primary completed	1.069 (23.12)	0.571 (18.44)	1.836 (30.01)	0.795 (20.12)	0.998 (27.11)	0.406 (4.21)
Middle completed	2.047 (49.33)	0.874 (28.74)	2.704 (48.50)	0.964 (24.46)	1.323 (36.58)	0.224 (2.11)
Secondary completed	3.363 (72.53)	1.254 (33.96)	3.895 (68.95)	0.951 (18.77)	1.838 (44.09)	0.670 (5.79)
University completed	4.958 (42.25)	1.909 (16.99)	5.739 (49.75)	0.998 (5.90)	2.959 (25.94)	1.385 (5.00)
SC/ST	-0.391 (13.28)	-0.749 (34.93)	-0.489 (13.86)	-0.142 (5.02)	-0.813 (29.79)	-0.507 (7.33)
Muslim	0.249 (5.36)	-0.242 (6.66)	0.222 (3.98)	0.357 (8.12)	0.626 (17.31)	-0.647 (4.54)
Number of household members	0.096 (20.02)	0.172 (46.09)	0.012 (2.01)	0.018 (3.25)	0.087 (19.36)	0.045 (3.50)
Per capita land owned (ha.)	4.135 (48.35)	5.879 (76.53)	2.597 (24.19)	-1.630 10.69	0.719 (6.67)	0.756 (2.64)
Constant	7.554 60.42	-2.119 (21.37)	-6.095 (35.23)	-2.323 (17.46)	-4.034 (33.30)	-3.700 (10.75)
Number of observations	95597					
log likelihood	126288.2					
Pseudo R2	0.212					

Sample: Rural, Males, 15 to 60 years
 Absolute value of z statistics in parentheses

Appendix Table 6: Occupational Choice by Multinomial Logit Model in 2004

	Not working	Cultivator	Nonfarm regular	Nonfarm casual	Nonfarm selfemployed	Farm regular
Age	-0.729 (94.29)	0.025 (5.05)	0.043 (5.26)	0.020 (3.05)	0.086 (14.31)	-0.061 (3.01)
Age squared	0.009 (89.12)	0.000 (0.15)	0.000 (1.38)	0.000 (5.36)	-0.001 (11.22)	0.001 (2.88)
Literate but below primary	0.006 (0.11)	0.231 (7.52)	0.885 (13.23)	0.205 (5.33)	0.566 (15.73)	-0.461 (3.37)
Primary completed	0.576 (11.98)	0.532 (17.89)	1.602 (26.97)	0.430 (11.68)	0.839 (23.98)	-0.253 (2.00)
Middle completed	1.552 (35.28)	0.749 (24.92)	2.262 (40.41)	0.633 (17.11)	1.180 (33.96)	-0.521 (3.60)
Secondary completed	3.127 (62.94)	1.254 (32.39)	3.454 (58.61)	0.594 (11.37)	1.875 (44.17)	-0.119 (0.68)
University completed	4.089 (43.77)	1.279 (14.86)	4.992 (54.54)	0.450 (3.48)	2.732 (32.19)	1.188 (5.09)
SC/ST	-0.441 (14.36)	-0.66 (30.29)	-0.404 (11.56)	-0.026 (0.96)	-0.799 (30.14)	-0.430 (4.78)
Muslim	0.228 (4.93)	-0.186 (5.25)	0.130 (2.32)	0.138 (3.18)	0.567 (16.16)	-0.477 (2.82)
Number of household members	0.109 (20.49)	0.184 (45.16)	0.065 (10.58)	0.048 (8.88)	0.116 (24.91)	0.048 (2.73)
Per capita land owned (ha.)	3.972 (45.20)	5.869 (75.22)	2.696 (25.87)	-0.789 (6.01)	0.552 (5.36)	2.965 (11.50)
Constant	8.764 (72.27)	-2.529 (26.94)	-4.736 (30.65)	-1.387 (11.86)	-3.403 (30.53)	-2.702 (7.29)
Number of observations	97184					
log likelihood	129110.6					
Pseudo R2	0.212					

Sample: Rural, Males, 15 to 60 years
 Absolute value of z statistics in parentheses